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Liquid Trade Effluents

A BRIEF reference was made in the issue of January 22 to the fact that the Public Health (Drainage of Trade Premises) Act 1937 was due to come into force on July 1 last. It is well that industrialists generally should be reminded that this Act which is now in force should, if properly applied, operate as a charter for the unfortunate manufacturer who in the past has willy-nilly produced obnoxious effluents upon which he has been forced to spend good money to remove from his premises. Since the inception of the Water Pollution Research Board a new spirit has been infused into this pollution problem.

The Board recognised the importance of tackling this difficult matter upon scientific lines, and at the outset laid down as their course of action that rivers must be kept healthy by preventing the discharge of bodies requiring high oxygen absorption for their removal in order that the 1,000 million gallons of water daily required for domestic use—most of which is taken from the rivers—should be pure. A further and most important principle was that the industry should not be penalised by being asked to adopt processes that entailed excessive costs and that the Board would assist industry in finding suitable processes. There is no need to discuss this aspect of the subject since it was dealt with in these columns previously, but it should be borne in mind that the Water Pollution Research Board affords help wherever it proves to be possible.

The manufacturer has been in considerable difficulty in the past in the disposal of his trade wastes because the local authorities have had the upper hand. Nominally there has been the right to discharge effluent into sewers, but in practice the right has been of little value. The Public Health Act of 1875 put upon every sanitary authority the obligation to provide such sewers as were necessary for draining their districts. Under this Act, moreover, owners of premises situated within the district were given the right to discharge their waste liquors into the sewers. This right was confirmed by the Rivers Pollution Prevention Act of 1876 and it appeared on the surface as if the local authority had to undertake to deal with trade wastes.

The local authorities, however, did not appreciate this burden, and perhaps not unwisely opposed the measure and succeeded in getting the obligation to accept sewage hedged about with so many restrictions as to be nearly valueless. It was laid down that no sewage works need accept liquids which would be detrimental to the sewers or to the disposal of the sewage, and facilities need not be given if the existing sewers were only adequate for the needs of the district. Local Acts of Parliament have removed the difficulty in certain districts, but it is only during the last year, and by reason of this new Act, that the law generally has been so amended on the lines of the several local Acts as to give manufacturers the right to discharge trade effluents into the public sewers, subject to compliance with regulations and conditions to be made as to payment and other matters.

It remains to be seen whether local authorities will accept their obligations. The local orders have yet to be made, and it would be advisable for chemical manufacturers to watch these closely in their own interests. There must evidently be some give and take, and the works must send to the sewage authority a sewage that is reasonably innocuous. It has been shown by the Water Pollution Research Board, for example, that gasworks effluent can be handled by a sewage works provided that it does not exceed 0.5 per cent. of the total sewage and is discharged *pro rata* with the general flow of sewage.

The partial purification of sewage at the works may be advantageous to the manufacturer and several cases have been cited by the Board in which products of value have been recovered in the course of effluent treatment. At Manchester gasworks, for example, phenols are recovered by washing the effluent from the ammonia stills and the process is claimed to show a profit. The annual report of the Board, to which brief reference was made in our issue of June 4 (page 441) shows that the general problem of water pollution is being tackled in three ways. The rivers are being surveyed to ascertain their condition and the extent and nature of the pollution, industry is being assisted to purify effluents on the works so far as is economically possible or necessary, and the sewage works are being assisted by scientific investigations to improve their processes. If the new Act is worked conscientiously and advantage is taken of scientific work the problem of trade effluents, so grave in a populated and industrialised country is on the way to solution.

If by Press advertising the public can be persuaded to telephone more, drink more milk, eat more fruit, and so on, surely a skilful campaign for industrial safety on similar lines would make workers conscious of the vital importance of due care during working hours.

—*Graham Cunningham.*

Notes and Comments

Calcium Carbide Manufacture

THE rejection of the Caledonian Power Bill in Parliament early this year has had an unfortunate, but not unexpected, sequel. It will be remembered that one of the major proposals contained in the Bill was the erection of a works at Corpath, by the British Oxygen Co., for the manufacture of calcium carbide, utilising electricity provided by a hydro-electric plant on Loch Quoich. The scheme was rejected largely on the grounds that it would be detrimental to the natural beauty of the district and that water used for carrying away the sewage of the town of Inverness would be diverted. The British Oxygen Co. also planned to produce carbide in South Wales and as the cost of generating current there would be higher than at Corpath, the Corpath plant was intended to subsidise the Welsh plant. Now that the Corpath scheme has fallen through, it was to be feared that the South Wales plan would be abandoned. This disappointing result was confirmed by Sir Thomas Inskip in the House of Commons at the end of last week. There is, however, the consolation that a new scheme for a carbide works at Holywell, North Wales, has been submitted to the Government committee inquiring into the possibility of producing carbide in Great Britain.

India's Import Trade

ACCORDING to a survey of the import trade of India for the year ending March 31 last, issued by the Department of Overseas Trade, the value of the imports increased by Rs. 48 crores to Rs. 173.45 crores compared with the corresponding period of 1936-37. This big increase in import trade is stated to be due to the inclusion of imports from Burma, and to short-lived activity in the early months of the year due to fear of increased prices. Total imports from the United Kingdom rose substantially, but the percentage share of the trade dropped as a result of intense competition with foreign countries. American and German imports expanded considerably, and although details are not known, the report states that imports of German chemicals showed a material advance. German dyes rose from Rs. 1.79 lakhs to Rs. 2.51 lakhs. The aggregate import of chemicals and chemical preparations increased by almost 25 per cent. to Rs. 3.33 lakhs compared with a reduction in the previous year. Notable advances were made in acids, caustic soda, sodium carbonate, sodium hydrosulphite and bleaching powder. It is interesting to see that of the three products for which details of countries of origin are available, imports of United Kingdom caustic soda and sodium carbonate increased while imports of the same products from all other countries showed a fall.

A Glimpse of German Economy

GERMANY'S self-sufficiency programme can be divided into three main sections of work; first, the production of substitute materials, second, the discovery of alternative sources of new materials, and third, the avoidance of waste. Much is heard of the progress made in the first two sections; but the third is considered to be equally important and is carried through with energy. Waste is avoided by the working up of any valuable constituents of commercial waste materials if the process is at all economically possible, and by the systematic collection of materials of the smallest value normally thrown away as rubbish. Professor J. von Lassberg in his article, "Developments in the German Cellulose Industry," describes some of the reasons for economy, and the actions being taken, in this industry. For instance, the spent lyes from the sulphite process consist mainly of resinous materials, together with a small proportion of sugars. Although alcohol is produced from these sugars and other products such as tanning agents are obtained from the lye, no economic process has yet been devised for utilising the greater part of its constituents owing to the cost of evaporation. Waste sulphate lyes, however, have been successfully worked up for some years. Official authorities and large business concerns already return all waste paper to the factory, and similarly collect small metal articles, such as discarded pen nibs. While our industries are interested in the working-up of waste materials, it is unlikely that similar methods of waste collection would be acceptable here in normal circumstances.

Oil Boring in Scotland

TEST oil borings in Scotland have now reached an interesting stage. On June 27 the Anglo-American Oil Co. first struck oil with their experimental well at Dalkeith, Midlothian, and it is reported that this well is now producing at a rate not far short of 1,000 gallons daily. The first substantial consignment was transported to Essex for refining this week. For over a year oil has been sought in many places in England and Scotland, but this is the first time that it has been announced that any has been found in considerable quantity. Until further announcements are made, the commercial possibilities of the Dalkeith field must remain largely a matter of speculation. During the War, oil was produced in Scotland in small quantities from numerous small deposits. The present find indicates a much larger source of oil than any found at that time, but it does not appear to be anything in the nature of a "gusher." That is the type of strike it is hoped to make, and it is the only type which can make an appreciable difference to the volume of oil imports from overseas.

Safety in Industry

FOLLOWING upon Lord McGowan's suggestion that road accidents could be reduced by a Government-sponsored publicity campaign, Mr. Graham Cunningham, managing director of the "Triplex" Safety Glass Co., Ltd., expresses the hope in a letter published in this issue that if this campaign be undertaken it will be extended to include safety in industry. Mr. Cunningham shows that almost as many accidents occur in industry as on the roads and in both cases carelessness is responsible for a very large proportion of them. Thus the worker in industry must be impressed with the need of taking care, and he suggests the only effective way that this can be done is by Government propaganda in the Press. He is careful to point out that this would not absolve the employer of his responsibility, for the law compels him to safeguard his workers. But the employer is not compelled by the law to educate his workers in safety matters. At present, however, most large works are well provided, at the employer's expense, with posters and other methods of making the worker accident-conscious. Propaganda in the works is found to give excellent results, and could not be satisfactorily replaced by propaganda in the Press. It must be made clear that any Government publicity campaign would be additional to the safety propaganda in the works themselves.

Development in the German Cellulose Industry

By
PROFESSOR J. VON LASSBERG

IN recent years the demand for cellulose and paper has increased considerably throughout the world. In Germany, owing to the position in regard to raw materials, special measures have had to be taken to cope with this problem. The improvements in the last few years in the production of cellulose and paper have arisen for the most part with this object in view.

Several new factors are now operating in the industry. The consumption of paper per head of the population has increased, the manufacture of artificial silk has grown considerably, the production of cellulose wool has been undertaken on a very large scale and the use of cellulose for various chemical purposes has increased to a marked extent. In the case of Germany, the annual consumption of paper and cardboard per head from 1933 to the end of 1936 increased from about 27 kg. to about 33 kg., that is to say by about 20 per cent. The amount of artificial silk used per head each year is 0.7 kg. (in Englang 1.1 kg.). In 1936, 45,000 tons of cellulose wool were produced; by the end of 1938 this will have been increased, by the five new cellulose wool factories according to Government plans, to an annual output of 140,000 tons which corresponds to the world output of cellulose wool for 1936. The use of cellulose for chemical purposes—as distinct from its use in the production of paper—also accounts for about 20 per cent. of the total demand for cellulose.

As far as raw materials are concerned, therefore, there has been an increased demand for wood for paper making. In 1936 it was about 8 million cubic metres (Norway 5 million cu. m., Sweden 12 million cu. m). Nevertheless, owing to exchange restrictions and other reasons, the substantial imports of wood for paper making, which accounted for almost 60 per cent. of the amount concerned, had to be reduced to a minimum. It thus became necessary to explore all the sources of raw material available in Germany.

Basis of Raw Materials in Germany

For the production of cellulose it is important that about 1 million cu. m. of mine timber are now available per year. Mention may be made here of the regulations with regard to the complete separation of cellulose wood from firewood (firewood output in 1934 about 25 million cu. m.). Much wood, which is still used at present as fuel, will in future go to the paper industry.

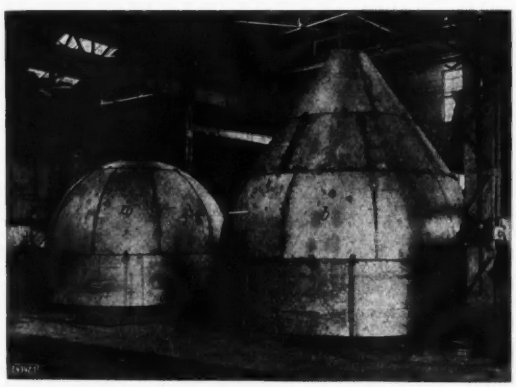


Fig. 1. Welded sulphite boiler of 250 cu.m. capacity (a) top part of boiler, (b) lower part of boiler inverted.

Before dealing with the use of pine and beechwood for producing cellulose, it should be noted that German forests consist of 44 per cent. pine, 25 per cent. spruce, 3 per cent. fir and 28 per cent. deciduous trees, particularly beech trees, i.e., 72 per cent. conifers and 28 per cent. non-conifers. The wood used in Germany for paper making has, however, consisted hitherto of 93 per cent. spruce and fir, 6 per cent. pine and scarcely 1 per cent. beech. Since the end of 1936 this proportion has changed considerably, as beech and firwood are used to an increasing extent for the manufacture of cellulose. These changes are still in their early stages and not yet concluded.

Beechwood

It has been known for many years that cellulose can be produced from beechwood. But the beechwood fibre is only about 1 mm. long (sprucewood fibre being three times that length) and is thus not very suitable for working up into paper. Only in certain coarse papers, such as blotting paper, filter paper, etc., in which the strength properties are of minor importance, small amounts of beechwood cellulose have been added for some time past.

In working up cellulose to obtain cellulose wool, artificial silk, etc., by the viscose process, however, the length of fibre is no longer a vital factor, since in these industries the cellulose fibres are decomposed in the preparation of the viscose. In addition, the content of alpha cellulose * is in most cases greater in beechwood than in sprucewood. For the production of viscose, therefore, beechwood has been used considerably; in some cases in existing works and in others in new plants of which mention may be made more especially of the Wolfen works of the I.G. Farbenindustrie. Here use is made either of the well-known sulphite process, or the beechwood is decomposed by weak nitric acid, obtained at low cost from other factories of the I.G.F.

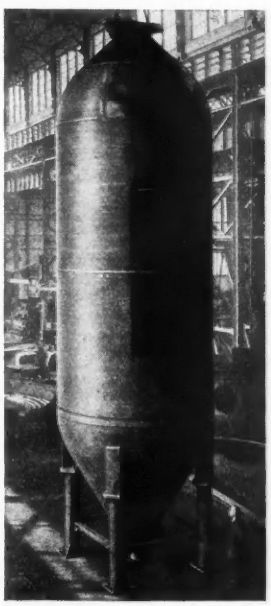


Fig. 2. Welded sulphate boiler of 70 cu.m. capacity.

Pinewood

Pinewood is now used to a greater extent for the manufacture of cellulose. The decomposition of pinewood, which is much richer in resin than sprucewood, is only possible with the sulphate process on account of this high resin content. In Scandinavia and Finland this process has been used on a large scale for years. Originally, the unpleasant smell from sulphate factories made itself known for miles around and this was one reason why the process had only been carried out on a very small scale in a densely populated country such as Germany. As a result of technical improvements, however, this unpleasant smell has now been eliminated, so that the alkali method of decomposing pinewood can be used without objection in Germany also. Near Küstrin and Stettin two large sulphate factories are already in process of construction and in 1938 they will be ready to treat pinewood on a large scale.

* All cellulose consists of alpha-, beta- and gamma-cellulose. Alpha cellulose is insoluble in cold soda lye containing 17.5% Na, the two other forms of cellulose go into solution. In the manufacture of paper beta- and gamma-cellulose are not as a rule detrimental, but in the production of viscose beta- and gamma-cellulose represent waste products, as they dissolve in soda lye, i.e., entail losses in the viscose producing process, which employs soda lye for saturating the cellulose. Consequently, for the viscose industry, cellulose should have as high a content of alpha cellulose as possible, between 88 and 96%, and the higher the better.

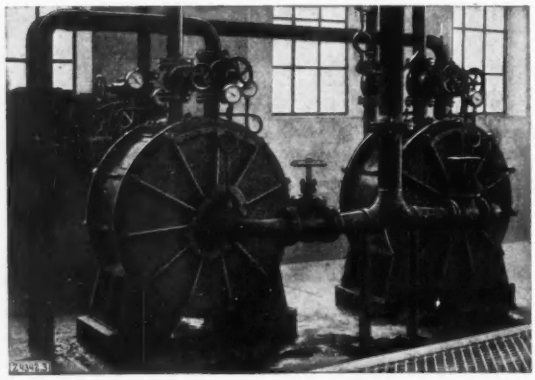


Fig. 3. Spiral heat exchange apparatus for cooling waste liquor in a sulphate factory.

Two results will be achieved by these German sulphate factories: (1) they will produce cellulose from pinewood instead of sprucewood and (2) they will make the country independent of imported sulphate cellulose, required for the production of paper sacks (cement bags, salt bags, etc.). This is moreover particularly important at the present time, since paper containers have to take the place of sacks made of textile fibres, such as jute.

A short consideration of the principal points of difference between the sulphate and sulphite processes is not out of place. For the sulphate process it is not necessary for the wood to be in such good condition as in the sulphite process; defective wood, and more especially sawmill waste, can be worked up by the sulphate process. In Sweden and Finland sawmill waste is treated on a large scale and sulphate factories often adjoin the principal sawmills. The method of decomposition forms the feature of differentiation as far as the production of sulphate and sulphite cellulose is concerned. The sulphite process decomposes by means of acids, the sulphate by alkalies, so that in sulphate factories the cellulose boilers can be made of ordinary iron without an internal brick lining. These boilers have a capacity of about 60 to 100 cu. m., and are much smaller than sulphite boilers which are built to hold as much as 340 cu. m. In place of the rotary sulphate boilers formerly used, stationary boilers are employed with pumps for circulating the boiling lye. The boiling period is 4 to 6 hours; complete circulation in the boiling process takes about 5 to 8 hours, which is considerably shorter than in the case of sulphite boilers. The boiling temperature is 180° (sulphite boiling 132 to 140°). The boilers are connected to a number of washing vessels (diffusers) into which the contents of the boilers are blown and in which the boiling lye (now back lye) is washed out of the material.

The black lye is completely worked up again; the alkali salts are for the most part recovered, the inflammable matter burnt and the heat used for further concentration of the black lye, which has previously been concentrated in multi-unit apparatus. The residual heat is utilised in waste heat boilers for steam production. In certain cases good results have been obtained with La Mont coils built into the flue behind the soda furnaces. In this process turpentine oil can be obtained at a definite stage.

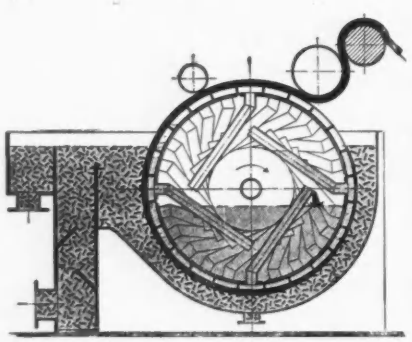


Fig. 4. The Strindlund filter.

Pinewood is not only decomposed by chemical means by the sulphate process. In recent years methods have been proposed for treating it mechanically by grinding with the same apparatus as used for grinding sprucewood. Pinewood treated in this way is used in the production of newsprint.

Straw

Straw has not yet been used to any great extent in Germany for the production of cellulose, but further developments are likely. The output of straw in 1936 for instance was about 38.8 million tons, of which only about 0.6 per cent. was worked up into cellulose. The bulky nature of the raw material makes the process difficult. Naturally there is also a great demand for straw as fodder and the like in agriculture, but other products could be employed with equal success for these purposes. In addition, the amount of straw treated so far is so small that a substantial increase should be possible without detriment to agriculture. The apparatus used for the production of cellulose from straw has also been much improved.

Waste Paper

Attempts are also being made to increase the recovery of waste paper by additional and better organised methods of collection. In 1936 the output of paper and cardboard in Germany was about 2.3 million tons, and of this only about 25 per cent. (about 650,000 tons) was recovered as used paper. If this amount were increased to only about one million tons, this alone would mean a saving of 0.7 million cu. m. wood.

Many economies could also be effected by careful treatment of the raw material itself, for instance, by reducing as far as possible the losses caused in stripping the wood in cellulose factories and wood grinding works, by increasing the yield of cellulose, by making half-cellulose products,* by using as much mechanical wood pulp as possible in the making of paper, by recovering as much fibrous material as possible from waste liquors and by similar measures.

Many sources of raw materials are still available therefore; it is merely necessary to recognise and utilise them fully. Complete or partial adoption of new raw materials, using modified or new methods of decomposition naturally demands much energy and adaptability on the part of those engaged in the industry if the difficulties involved are to be overcome.

Manufacture of Cellulose

The vital point in the production of cellulose is the boiling process and at the present time important developments are taking place in this field. The Wolfen cellulose works of the I.G. Farbenindustrie for instance, in collaboration with Messrs. Fried. Krupp A. G. Essen, have introduced a sulphite boiler of 250 cu. m. capacity, made entirely of V 4 A-steel and welded throughout. (Fig. 1). The internal brick lining usually used in sulphite boilers to protect the tin plating is omitted entirely. In order to economise in imported material, Messrs. Krupp have recently constructed cellulose boilers of so-called plated metal sheets, in which the base consists of ingot steel of boiler plate quality or durable Izett steel, with a plating layer of acid-proof steel, about 3 mm. thick firmly combined with the base.

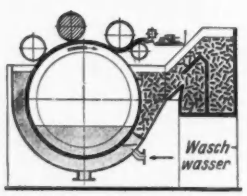


Fig. 5.

The sulphate boilers (Fig. 2) which are now supplied for a new German sulphate factory and have capacity of 70 cu. m., being thus much smaller than sulphite boilers, can be made of Izett steel, as an alkaline process is used for decomposition. These boilers are also welded throughout.

* Substances in which the incrustations are not completely dissolved out, so that they result in a higher yield by weight from the wood. Mechanical wood pulp, containing all the incrustations is the extreme case. Yield in the case of cellulose—150 kg. per cu. m. wood; yield in the case of mechanical wood pulp—300 kg. per cu. m. wood.

Cellulose boilers are now equipped to an increasing extent with means for circulating the lye; the Swedish Wallin-Svensson process is a further innovation. It is particularly suitable for direct boiling and operates without a pump. In conjunction with the various pump circulating systems, it is a growing practice to pre-heat the fresh lye outside the boiler. A number of constructions have been proposed for pre-heating the fresh lye. In attempts to make the fullest use of waste heat from the boiling process, a very successful expedient has been discovered in the spiral heat exchange devices which are particularly practical for the cellulose industry, being simple and small, with high coefficients of heat transmission. By this means the waste heat from the boiling process, that is to say, the heat from the hot spent lye or residual liquor (Fig. 3), the expansion vapours from spent lye and the waste gases from the boiler can be utilised fully.

Cellulose Bleaching

In the treatment of cellulose after boiling, the many new methods of using cellulose for chemical purposes have led to extensive improvements in refining processes. New cellulose bleaching plants have been constructed or existing hollander bleaching plants have been improved by the addition of bleaching towers in recent multi-stage bleaching. In Germany extensive use is made for this purpose of the Thorne-Bellmer mutli-stage bleaching process, in Scandinavia and other countries of the Kamyr bleach process.

Recently not only sulphite cellulose, but also various types of sulphate cellulose, hitherto considered almost unbleachable, have been well bleached by highly evolved multi-stage bleaching processes, so that sulphate cellulose can now be used for purposes from which it was prohibited owing to its dark brown colour. Owing to the difficulty in bleaching this substance and to the high consumption of chlorine involved, four to five bleaching stages are necessary. In bleaching towers operating continuously, elementary chlorine is used in most cases in the first stage, and hypochlorite in the subsequent stages. Between the actual bleaching stages there are intervening treatments with alkalies. By such multi-stage bleaching it is possible not only to produce cellulose with improved chemical properties, but in comparison with the single stage bleaching process usual in bleaching hollanders, there is a great saving in chlorine. The chlorine measuring and supplying apparatus have also been improved.

Cellulose Filters

The various bleaching stages alternate with washing processes for removing the residues from the preceding bleaching stage. The substance is dehydrated with various filters, washed and dried to the extent required. The Strindlund filter is an improved filter for this purpose. (Fig. 4). It is particularly simple in structure and essentually resembles the concentrating cylinder rather than the suction cell filter. Owing to the rearward curvature of the tubes inside the drum, the water column in the tubes is also raised during the upward rotation of the drum. The tubes are only aerated when the appropriate point of the drum periphery is directly in front of the apex. The partial vacuum produced in this way is sufficient, in conjunction with the pressure rollers, to cause a considerable dehydration of the material. By the application of pressure rollers the various degrees of concentration needed in the cellulose bleaching process can be obtained. If a rubber grooved press is connected behind the Strindlund filter, this arrangement enables the material to be concentrated to about 30 per cent. for various other purposes.

It is often necessary to wash the material thoroughly by forcing water through the web. This can be done satisfactorily with washing filters as shown in Fig. 5. As a result of the fact that the washing trough extends down into the filter box, a comparatively large amount of water is forced through the web of material in a given time.

After the chlorine bleaching stages the filters and other parts of the apparatus should be protected by means of rubber.

For cellulose sifting mention may be made of a new jigger apparatus, which can be used as knot catcher as well as for preliminary and fine sifting. It is compact in structure and enables very fine sifting with large output. In addition, over a period of years, highly improved sifters have been evolved which separate and consolidate the more valuable long fibres from the short fibres which also contain a considerable amount of resin and other impurities.

In the production of cellulose during the various diluting processes and during the appreciable amount of washing required by multi-stage bleaching, a certain amount of fibrous material naturally passes into the waste liquors. Damage to the sieves and defects in operation may also cause much waste. A device on the market records diagrammatically the weight of fibre lost in the waste liquors.

For drying sulphite and sulphate celluloses, hot air driers have been adopted to an increasing extent as substitutes for or as additions/to cylindrical driers (temperature about 70°), as with such apparatus the material is very carefully dried at lower temperatures (about 45°). For some works in Finland and Soviet Russia with large daily outputs so-called Minton vacuum driers are employed. Here the entire drier cylinder is placed in a large cast iron vacuum chamber and the material maintained at a temperature of about 40°. The drier deals with as much as 240 tons daily.

Working up of Spent Lye

In spite of all attempts a vital problem still remains unsolved, that of working up the waste sulphite lye, containing all the incrustation constituents of the wood dissolved in the sulphite boiling process. Since sprucewood at a rough estimate contains about 50 per cent. cellulose and 50 per cent. incrustation matter (resins, etc.) spent sulphite liquor contains an amount of dry substance practically equal to the amount of sulphite cellulose produced (in Germany about 3,000 tons daily). It is true that the sugar content of the spent lye (about 2 per cent.) is worked up into alcohol in the sulphite alcohol factories associated with most German cellulose works and it is also true that various products such as bonds, tanning extracts, active charcoal, etc., are made from the spent lye or from the waste liquor produced by the alcohol factory, but this is far from exhausting the large amount of substances passing daily into the spent lye. The obvious combustion of these dry residues after a preliminary evaporation has not hitherto been economic owing to the great heat required for evaporating. However, definite progress has been made in the proposal of a thermal process in which the incrustations, hitherto of such a disturbing character in the vaporisers, have been much diminished. The proposed distillation of the dry residues from spent sulphite lyes and the simultaneous recovery of important chemical constituents have not yet gone beyond laboratory tests.

In the case of waste sulphate lye, the alkali salts that can be recovered make evaporation and subsequent combustion a worth while proposition. Consequently the waste lyes obtained in the sulphate cellulose industry have been worked up everywhere for some time past. A large test plant for distilling waste sulphate lyes is also in operation in Germany.

UNITED STATES ZINC INDUSTRY

PRODUCTION, consumption, and prices of zinc in 1937 were decidedly better than in 1936, according to the United States Bureau of Mines, but the year was characterised by violent fluctuations and most of the gains recorded in the early months of 1937 were offset by rapid declines in the closing quarter. Of outstanding interest in the United States was the acute shortage of metal for prompt delivery and the consequent importation of the largest tonnage of foreign metal ever recorded. The production of distilled and electrolytic zinc at primary zinc reduction plants amounted to 608,458 short tons, valued at $79,100,000, increases of 14 per cent. in quantity and 48 per cent. in value from the production of 534,341 tons, valued at $53,434,000 in 1936.

Letters to the Editor

Safety in Industry

SIR,—With reference to the suggestion made by Lord McGowan that the Government could help to reduce road accidents by advertising "Safety First," I trust that, if a safety publicity campaign be initiated, it will not be confined to road safety only, but will include safety in industry.

There is no doubt that the general public fails to realise the high toll of accidents in industry to-day. Although the proportion of fatal accidents is greater on the road, the number of non-fatal is, according to the latest official returns, almost as great in industry. During 12 months 192,725 people were killed or injured on the roads and 175,470 were killed or injured in factories and workshops. The latter figure does not include accidents which occurred in mines, quarries, docks, railways, shipping and building industries. If these are included the figure of 175,000 is increased to 400,000. Add to this again the fatal and non-fatal accidents in the home and everyday life, which are even more numerous than those occurring on the road or in industry, and if, in addition, we add the deaths and disablements due to industrial illnesses and diseases, the figure becomes appalling. It is appalling not only on account of the numbers, but because I am convinced that, if proper action were taken, a large number of the accidents in this country in industry, on the road, and in the home could be avoided. Carelessness seems to me to be the underlying cause of so many accidents that, if only the public could be told and impressed with the importance of taking care, the figures would be rapidly decreased. Propaganda then, is, I believe, the cure for the greater part of this trouble.

I have recently been examining the official analysis of accidents coming within the Factories and Workshops Act in order to ascertain to whom propaganda for improving the situation should be addressed, and I noted that accidents among juvenile workers (on an analysis of 55,000 people) showed that 44 per cent. of accidents to boys were the responsibility of the young worker, and of girls as much as 51 per cent. Over 21,000 were injured merely by falling down.

Surely something can be done to appeal to the sense of the worker, and bring home to him the responsibility which he must bear towards his employer and his work? I suggest the only effective way that this can be done is by Government propaganda in the Press.

This would in no way immunise the employer from his responsibility for reducing accidents, for he is compelled to safeguard his workers by law. From my personal observations of factory conditions in France, Germany, Italy and other European countries, we are far in advance of them in this respect, but there is still a great deal that can be done to reduce what psychologists call "accident proneness."

Young children in the classrooms are being taught road safety to-day; in the same way workers, from their earliest years, could be instilled with the idea of industrial safety. If by Press advertising the public can be persuaded to telephone more, drink more milk, eat more fruit, and so on, surely a skilful campaign for industrial safety on similar lines would make workers conscious of the vital importance of due care during working hours, and thus help to safeguard lives and keep bodies whole.

There is no doubt that a strong case can be put forward for Government propaganda, on a matter which urgently affects both employers and workers, and also the country at large; and it is to be hoped that such a campaign will receive serious consideration.—Yours faithfully,

GRAHAM CUNNINGHAM,
Managing Director.

The "Triplex" Safety Glass Co., Ltd.,
1 Albemarle Street, W.1.
July 29, 1938.

Friends of Queen Mary College

SIR,—Glancing to-day through the list of the year's bequests, I was impressed by the extraordinary generosity displayed and by the fact that, while the great majority of donors give huge sums to hospitals, charities, and churches, few remember the claims of our 70 British universities.

Far be it from me to suggest that bequests to hospitals and churches be deflected, or that donations, however abundant and generous, can offset neglect of the nation's educational system—a system that has the university as its apex. It is true, however, that in university circles, more than anywhere else, are to be found Britain's future leaders. It is equally true that certain colleges are doing brilliant work in spite of very real financial handicaps.

Naturally I have one such college in mind—Queen Mary College, formerly known as East London College, which is doing a great work in a crowded area of the Metropolis. It could not have attained its present status as a distinguished school of the University of London without the generous help of the Drapers' Company. But there are limits to assistance from this source, and these limits have now been reached.

Ingenuity and courage in high degree have been displayed in order that the college should not suffer from shortage of funds, but now the rebuilding and modernisation of the college are in hand and must be completed.

To help to this end, a guild of Friends of Queen Mary College is being formed. It may be that many people would like to know the part the college has played—and is destined to play, not only in the educational life of Greater London's vast and increasing suburbs, but in the life of the nation and the Commonwealth. Need I add that I shall be happy to supply such details to all who would care to help?—Yours faithfully,

GUY W. KEELING,
Secretary of the Friends of Queen Mary College.

Queen Mary College,
Mile End Road, E.1.
July 29, 1938.

Chemical Matters in Parliament

Calcium Carbide Factory, South Wales

IN the House of Commons on July 28, Mr. Cove asked the Minister for the Co-ordination of Defence whether any steps have been taken to carry out the undertaking given to the Government to establish a calcium carbide works in South Wales; and whether any action is being taken by any other company to establish works for the same purpose in any other part of the country?

In reply, Sir T. Inskip said the undertaking given by the British Oxygen Co. was to proceed with the Port Talbot part of their scheme without awaiting the decision of the House on the Caledonian Power Bill. In pursuance of this undertaking they actually acquired a site at Port Talbot and entered into covenants as to building on the site. They also set on foot various negotiations for supply of the necessary limestone and other materials. The Government had informed the House on November 18, 1937, that they regarded as satisfactory the proposals of the British Oxygen Co., which were for a combined scheme to produce calcium carbide at Port Talbot and Corpach. The Corpach part of this scheme was rejected by the House. The decision of the House was not unreasonably regarded by the British Oxygen Co. as creating a new situation, and he was now advised by them that, after full consideration of that situation, and especially of the present commercial possibilities for production of calcium carbide, they do not feel justified in proceeding with the Port Talbot part of the scheme.

Potato Marketing Board Inquiry

Close of Proceedings in London—Counsel's Final Speech for the Board

THE inquiry into the proposed amendments in the powers of the Potato Marketing Board, was continued at the High Court, London, on July 28, when Capt. John Mollett, the chairman of the Potato Marketing Board, concluded his evidence and was questioned by the Commissioner. The Commissioner referred Capt. Mollett to a passage in a book of the Economic Series, in which reference was made to potato by-products when making alcohol from potatoes. In that it referred to distillery residue, which contained the whole of the nitrogen, phosphorus and potash of the potatoes, which could either be returned directly to the soil, or used on the farm. He asked Capt. Mollett whether he was suggesting there were some by-products apart from those residual products.

Lack of Technical Knowledge

The witness said that he understood that there were some by-products or residue products which might emerge.

Mr. Le Quesne: Nobody has given me the name of any by-product which emerges; can you? It was suggested by Mr. Davidson Pratt that these are not by-products?

Capt. Mollett: By-products are synthetic organic chemicals, but whether they are by-products of the residual or the alcohol I cannot say.

Mr. Le Quesne: The position is there may or may not be something else left there, apart from the distillery residue?

Capt. Mollett: That is our general opinion, and we do not know what by-products may emerge when we use new methods.

Mr. Le Quesne: At the moment, are you able to tell me whether, in the manufacture of alcohol from potatoes, there emerges over and above these residues, something else that can be held to be a by-product?

Capt. Mollett: I cannot say, and can only say that our expert has given us those words to put in the section.

Referring again to the book, the Commissioner said that it stated that because of the price levels of potatoes, no profitable industry could be founded, using potatoes as material for distilling. It further pointed out that the only way out of the matter would be for the potato trade to subsidise factories by supplying potatoes of poor quality, but at the same time it raised the almost insurmountable difficulty of running a distillery on irregular supplies.

Capt. Mollett replied that at the time of the report, there was no Potato Marketing Board.

Replying to further questions, the witness said they would always have the difficulty of irregular supplies, but they would have to overcome that difficulty if they were going to dispose of the surplus. He did not think he had heard a witness say that the casual surplus should be destroyed, and if it was not to be destroyed, what was to be done with it? They had formed no plans at the moment for immediate operation in manufacturing, but they had in mind the expansion of a factory on similar lines to the one of the Farmers' Marketing & Supply Co., Ltd., at Wisbech. They always had a permanent surplus in small potatoes, or potatoes that could not be used as ware or were diseased. In a crop of about four million tons, they had a surplus of about half a million. On three-and-a-half millions, the surplus would be between 350,000 to 400,000 tons. There was almost bound to be a loss by the farmer on surplus potatoes he produced, and the profit he would be likely to get by selling them for manufacture to the Board would not tempt him to increase his acreage.

Addressing the Commissioner on behalf of the glucose industry, and manufacturers of food and cattle products, Mr. John Senter said that the suggested new powers had caused apprehension in the minds of established industries. These were responsible and substantial, and the objections they had raised were entitled to very serious consideration because drastic powers were given to the Board. He submitted there was no evidence that full examination had been made into the proposals as put forward by the Board, and he further contended that the Board had no power to deal with any product not wholly made from the regulated product. That was really an *ultra vires* point. To give a concrete example, under Clause 74 (1) (b) (1) the Board desired powers to manufacture cossettes and nuts. The evidence was that only five per cent of potatoes could be used in making them, and that other things, such as linseed oil, had to be added. The question was whether the Board was getting powers to produce from potatoes food which would require other ingredients in addition to the potatoes. He contended that the Board had no power to do so under the Agricultural Marketing Acts.

Making his final speech for the Board, Mr. R. P. Croom Johnson, K.C., said that the scheme as put forward by the Board was that they should manufacture a list of articles from potatoes, and these commodities were known as potato products. He did not shrink from the point of view that, of course, in the production of these commodities from the regulated product, they would have to use other things. The question as to what degree the regulated product was going to be used was not a point to be argued. That was a question for the Minister of Agriculture and Parliament. They had to consider whether the power should be given, after the Commissioner had considered objections by persons affected thereby: the degree did not matter. As an illustration, he mentioned that the Milk Marketing Board had power to produce ice-cream, and the percentage of milk used did not matter. If the Minister and Parliament came to the conclusion it was a good thing to produce something or other from some commodity, and even if the potatoes necessary to be used were only one per cent. of the product, then the Board's powers were completely ample, and there was no question of *ultra vires* that had been raised by some of the objectors. He asked why it was said that if the Board had powers to manufacture something out of an agricultural product, they were not promoting a scheme for the regulation and marketing of an agricultural product. The complaint was that the Board, by seeking the amendments, were not seeking to regulate the market, but were coming into the market to dis-regulate by joining the Board's competition with the competition that already existed. There was no point in them discussing the matter any further there, because the Minister would deal with this, and he decided and came to the conclusion that the powers were to be in the scheme, then it was *intro vires*, subject to Parliament.

A Private Discussion Not Permitted

The London inquiry concluded on July 30. When the proceedings opened the Commissioner said he would like to make one point plain. When the inquiry had previously adjourned it had been arranged to hold a private sitting, so that counsel could refer to the agreement between the Farmers' Marketing and Supply Co., Ltd., and the Board, without embarrassment. He had, however, looked at the rules which had been made for the conducting of these inquiries, and found they should be in public. The private meeting, therefore, was not held.

Mr. Croom Johnson said that the people who had to decide whether the amendments were in shape and should go forward, were first of all the Minister of Agriculture & Fisheries, and the Secretary of State for Scotland, and afterwards the two Houses of Parliament. The procedure, as he envisaged it, was that people who found themselves affected in their business, or likely to be affected, had a right to make an objection to the Minister, but the objection had to be because their own business was affected. He made the same point

as he did with the objections put forward by the county councils, that they had no right to come forward to protect the producers. They should not be allowed to come to the inquiry for the purpose of putting the Board right. They only had the right to come forward by way of objection to protect their own interests. There was ample machinery under the Act of Parliament to put the Board right if anything was being done wrong under the scheme. There was an appropriate method by which the Committee of Investigation functioned under Section 9 of the 1933 Act. The Committee was a permanent body set up under the Acts generally, and therefore a body well acquainted with marketing scheme generally. It was a large body, and had much wider powers than the Commissioner, and those who had had the privilege of appearing before them would know that they could go into almost anything.

Counsel said that he wanted to make it quite clear that he was going to look at the objections to Section 74, not on the basis of whether the Board had done wrong, but whether they had made out a case so that the Commissioner could report to the Minister that they would be adversely affected by the proposals. It was of the greatest advantage to everyone to see that complaints under sub-section 2 or 3 went to the Committee of Investigation. The merchants, generally and broadly, were taking objection to the manufacturing proposals of the Board, and the reasons why they were making the objection was, he thought, quite clear and plain in their original objection. The reason was that the merchants were apprehensive that, if the Board obtained these powers, the Board would not use the merchants for the purpose of conducting the operations which they made. Under the existing scheme and the law, the Board were under no obligation whatsoever to employ one single merchant in any transaction which the Board might undertake. The Board was not a registered producer, and the first step in his legal argument was that the Board was completely untrammelled as to whether it bought or sold direct from the producer, or did not buy at all. The Board were able to co-operate in any way with any other person in selling, but the notion that by these amendments the Board were being empowered to take away something from the merchants which they had at present was utterly without foundation. The Board were seeking to widen their powers to deal with the disposal of any potatoes they had bought.

Money Needed to Set up Factories

The Board had about £25,000 to play with, and it was perfectly true that the Board had managed to build up a small reserve fund of some £100,000 which they had invested, but where was the money coming from, and who was going to lend them these large sums of money which would be needed to set up all the factories that people imagined? Everyone of these people who had objected were thinking the country was going to be bespattered with glucose and chip factories, and the only distinction from other factories would be by having the magic letters P.M.B. over the top. Nothing was further from reality.

It made one despair of British industry when one knew what was going on in the world of science, continued Mr. Croom Johnson. He expected to hear statements that experiments had been made to produce acetone and such-like things, but no explanation was given as to why the knowledge in Germany which was used in that country many years ago, was not attempted to be put into use here. No evidence was given that the chemical manufacturers or other industries had tried to do a single thing with potatoes, except put them into cans. They were the same people who said it was unethical for the Board to come on the scene in 1934 when agriculture was in desperate straits, and by co-operation and research, try to do something with the surplus potato problem. The Board regarded it as one of the most dreadful criticisms of British industry and commerce that these gentlemen who came to the inquiry and said they had done nothing, should complain because that was the guise in which they appeared, and complained that the Board in those circumstances was seeking to do something. They turned round and said that the Board should have consulted them before. Why on earth should the Board consult all these people who had done nothing? If they were all attempting to do things, one could understand the complaint, but man after man had come into the witness-box with his commercial tail between his legs and said it was quite impossible for the Board to carry on at a profit, and they would have to subsidise their losses out of the poor farmer.

All these people who said it would be impractical for the Board to go into these markets had not produced a single piece of evidence to indicate that the Board intended to do anything of the sort. The idea that the Board would consistently go on losing money did not have regard for the fact that the Board were an elected body, and the members were responsible to their constituents. The idea that the Board were going wildly into experimental manufacturing at great loss to themselves had no justification at all.

In his concluding remarks, Mr. Croom Johnson submitted that the objections utterly failed. It was said that the Board would use their powers uneconomically. That seemed to him ridiculous, because a Board which had the responsibility of the potato industry could not take leave of their senses and go bald-headed into the manufacture of a series of articles of which they knew nothing.

The inquiry will open in Edinburgh on September 19 to hear the Scottish objectors to the amendments.

Water Cure of Latex Products

Evidence that Water-soluble Accelerators are not Extracted

LATEX products are usually vulcanised at relatively low temperatures, below 212° F. (100° C.) because ultra-accelerators can be used without the danger of scorching. These low-temperature cures may be carried out in air or in water. The use of water-soluble accelerators in water cures has been subject to considerable controversy inasmuch as it is believed that they are extracted in this type of cure. A paper by Mackay (*Ind. Eng. Chem.*, 1938, *30*, 826-9) is presented to show that the common and well-known water-soluble accelerators are not extracted from the rubber film during vulcanisation in water.

Eight-hour extraction with 160 litres of water did not remove any measurable quantity of the 5 grams of piperidine cyclopentamethylene dithiocarbamate or the 10 grams of sodium mercaptobenzothiazole from 1,000 grams of rubber film. A similar quantity of 0.1 per cent. sodium hydroxide solution did not remove any measurable quantity of the 1 gram of sodium pentamethylene dithiocarbamate or the 10 grams of sodium mercaptobenzothiazole from the rubber. The extraction removed water-soluble non-rubber constituents, giving a softer rubber film. The water-soluble accelerators tested had a selective solubility for rubber which is many times their solubility in water.

Ten Years Back

From "The Chemical Age," August 4, 1928

In 1927, Japan produced 12,000,000 lb. of artificial silk, or nearly 5 per cent. of the world's production.

* * * *

The Earl of Derby, on Friday, July 13, set in motion the plant of the Penpoll Tin Smelting Co., Ltd., at Bootle. The Penpoll smelter is capable of refining one-third of the total tin ore supply of the entire world.

* * * *

Colonel Sir Edward Alen Brotherton, Bart., D.L., LL.D., chairman of Brotherton and Co., Ltd., has been elected a Freeman of the City of Wakefield. The firm of Brotherton and Co., Ltd., was founded by Sir Edward at Wakefield just fifty years ago.

The Chemical Age Lawn Tennis Tournament

Arrangements for the Finals

As already briefly announced, the finals of the eighth annual CHEMICAL AGE Lawn Tennis Tournament are to be held on Saturday afternoon, September 3, at Alderbrook Park, near Guildford, Surrey, by the kind invitation of Mr. A. Van den Bergh, chairman of Van den Berghs and Jurgens, Ltd., and joint vice-chairman of Lever Brothers and Unilever, Ltd. Alderbrook Park is situated in a most attractive stretch of country between Guildford and Cranleigh, the grounds are attractively laid-out and the house is so placed that delightful views of the surrounding country are obtained. The beautiful terraces in front of the house, the rose gardens, the lawns, and the lake are among the outstanding features of

A rose garden in the grounds at Alderbrook Park.

Alderbrook. The court itself is a hard court in first-rate condition, well protected by trees. Play is due to begin at 2.30 promptly.

As regards travelling arrangements, a train leaves Waterloo at 1.20 p.m., arriving at Guildford station at 1.55 p.m. This train will be met at Guildford station by a special coach which will convey the party to Alderbrook Park. Similar arrangements have been made for the return journey. For those travelling by road from London, the accompanying sketch map shows the most satisfactory route. The Kingston By-pass road is taken for Guildford, turning left in Guildford High Street for Bramley. Pass through Bramley, turning off the main road to the left two miles further on (almost opposite a brickworks). Continue along this road until coming to a petrol station on the right-hand side. Turn left shortly after the petrol station and keep straight on for one mile, when the gates of Alderbrook Park will be seen on the left.

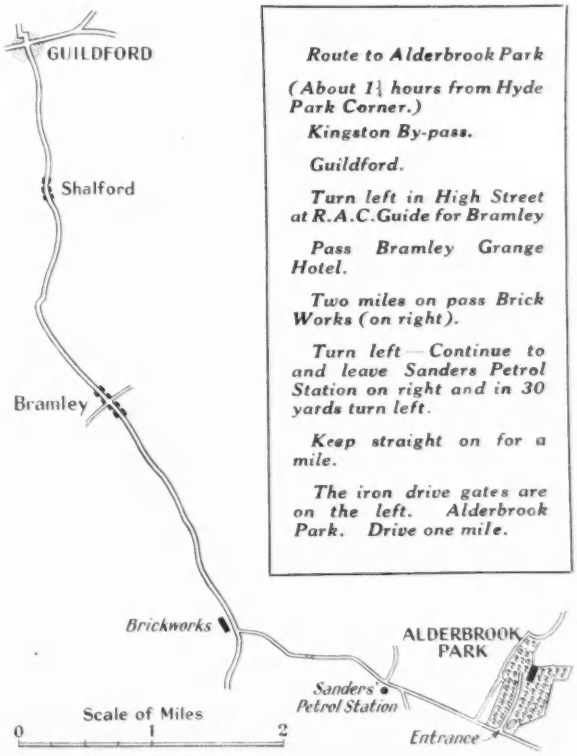
The play consists of two matches, the finals of the men's singles and doubles. If time and weather conditions permit, they will be decided upon by the best of five sets; otherwise the best of three sets will be played. The singles match will be played first, after which there will be an interval for tea at 4 p.m. approximately, by invitation of Mr. Van den Bergh. Immediately after tea the finals of the doubles will be held. At the finish of the day's play, Mrs. A. Van den Bergh has kindly consented to present the prizes. The CHEMICAL AGE silver challenge cups, to be held for twelve months, and the "Invicta" silver statuettes, given by Thomas Hill-Jones, Ltd., will be presented to the winners. The "Lloyd Willey" silver statuettes, given by Mr. Lloyd Willey, a director of Thomas Hill-Jones, Ltd., who has staunchly supported the competition since its inception, will be awarded to the runners-up.

There is still almost a full month to run before the finals, and play in the tournament has now reached the semi-final rounds. Mr. R. J. Sleap (United Yeast Co., Ltd.) and Mr. F.

A view of the house at Alderbrook Park.

Darton (J. Buchanan and Co., Ltd.), however, have already played off their semi-final match with Mr. C. C. Gough and Mr. T. P. Williams (Lever Bros., Port Sunlight, Ltd.) in the doubles, which they won in three straight sets 12-10, 6-3, 6-1. They will thus appear in the final against either Mr. G. W. Hole (Anglo-Saxon Petroleum Co., Ltd.) and Mr. C. G. Smith (Shell-Mex and B.P., Ltd.), the holders, or Mr. A. F. Eyres and Mr. W. Hoppe (Johnson Matthey and Co., Ltd.), who have yet to decide their semi-finals match. Both Mr. Sleap and Mr. Hole are in the semi-finals of the singles, so there is a possibility of one of them winning both singles and double cups; a feat which has only once been performed before in the history of the competition. While Mr. Hole and his partner may have the chance of retaining the doubles challenge cup for a further year.

The following are the results of the fourth round of the singles:—E. Pavitt (Co-operative Wholesale Society, Ltd.) defeated Clifford Thedford (Monsanto Chemicals, Ltd.) 6-1, 4-6, 6-0; R. J. Sleap (United Yeast Co., Ltd.) defeated H. G. Wyrill (Ever Ready Co. (Great Britain), Ltd.), 7-5, 6-3; G. W. Hole (Anglo-Saxon Petroleum Co., Ltd.) defeated A. W. A. Goudie (Corn Products Co., Ltd.) 3-6, 6-1, 6-1; and C. G. Copp (Doulton & Co., Ltd.) defeated G. A. Hanson (Whiffen & Sons, Ltd.) 6-3, 4-6, 7-5.


GUILDFORD
Shalford
Bramley
Bricknorks
ALDERBROOK PARK
Sanders Petrol Station
Entrance
Scale of Miles
0
1
2
Route to Alderbrook Park
(About 1¼ hours from Hyde Park Corner.)
Kingston By-pass.
Guildford.
Turn left in High Street at R.A.C. Guide for Bramley
Pass Bramley Grange Hotel.
Two miles on pass Brick Works (on right).
Turn left — Continue to and leave Sanders Petrol Station on right and in 30 yards turn left.
Keep straight on for a mile.
The iron drive gates are on the left. Alderbrook Park. Drive one mile.

I.C.I. President Retires

Mr. H. J. Mitchell's Long Association with Industry

MR. H. J. MITCHELL, president of Imperial Chemical Industries, Ltd., since 1936, is retiring on the advice of his medical advisers, but will remain a director of the company.

Mr. Mitchell is one of that small and select band who have risen to the highest positions in industry without becoming widely known to the general public. Yet few industrialists of the present day are better equipped or have a wider knowledge and experience of all aspects of trade and commerce. He entered the service of the Nobel-Dynamite Trust on probation in 1893, and by steady advancement reached the position of secretary to the company in 1912.

When the outbreak of war raised the problem of segregating the British and German interests of the Nobel Trust, Mr. Mitchell was appointed liquidator of the Trust company and carried through the difficult negotiations which led to the final agreement covering the re-organisation, and in 1915 he joined the staff of the re-organised Nobel's Explosives Co., Ltd., as assistant general manager at the headquarters of the company in Glasgow. There then began an even more intimate association with Lord McGowan than had existed in earlier years; incidentally an association which has now lasted for over 38 years and is probably unique in industry.

The immediate task was to face the problem of munition supply, but an equally difficult task lay ahead in the question of what was to happen with the various companies engaged in the explosives and cognate trades when the war ended and competition re-asserted itself. After many months of negotiation, the solution was found in the formation in 1918 of a combination of the explosives and ammunition interests of Great Britain under the name of Explosives Trades, Ltd., later altered to Nobel Industries, Ltd. Lord McGowan (then Sir Harry McGowan) was appointed chairman and managing director and Mr. Mitchell, general manager.

Mr. H. J. Mitchell, who is retiring from the Presidency of Imperial Chemical Industries Ltd.

In October, 1920, Mr. Mitchell joined the board of Nobel Industries, Ltd., and on the formation of I.C.I. in 1926, in which he took no small part, he was elected one of its original directors. His knowledge has been of the greatest help to Lord McGowan in the solution of the many problems which have from time to time faced I.C.I. He combines with his executive ability and a great capacity for work, a personality which, added to his wide experience, provides the clue to his success as a negotiator, as have been proved on many occasions.

Metallic Soaps of Petroleum Fatty Acids

Application in Paint Manufacture

WITH the preparation of synthetic fatty acids by oxidising mineral oils and paraffins experiments have also been made to exploit the oxyacids, obtained in this process and not suitable for manufacturing soap, as varnish substitutes. Synthetic fatty acids obtained by oxidation of petroleum hydrocarbons have been recommended as raw material for the production of varnish (c.f. D.R.P. 405,850).

D.R.P. 518,094 proposes for this purpose calcium, aluminium, zinc, manganese, copper, mercury, cobalt, lead, etc., salts of the fatty acids obtained either by heating the acids with oxides or hydroxides of the corresponding metals, or by conversion of the sodium salts with water-soluble salts of the heavy metals. According to the Russian Priority 34065 the calcium salts of the acids obtained by oxidising vaseline oil are suitable for the production of varnish substitutes.

The investigations made by Tchernov show that the strength of films prepared from artificial varnishes depend largely on the pigment and filler used in production and is increased by adding "active" materials. Asbestos suitably ground proved to be such material. Paints consisting of calcium salts of a mixture of synthetic acids (dissolved in white spirit), filled with asbestos, are extremely resistant against atmospheric influences. Iron coated herewith showed only 2 to 5 per cent. corrosion after nearly two and half years.

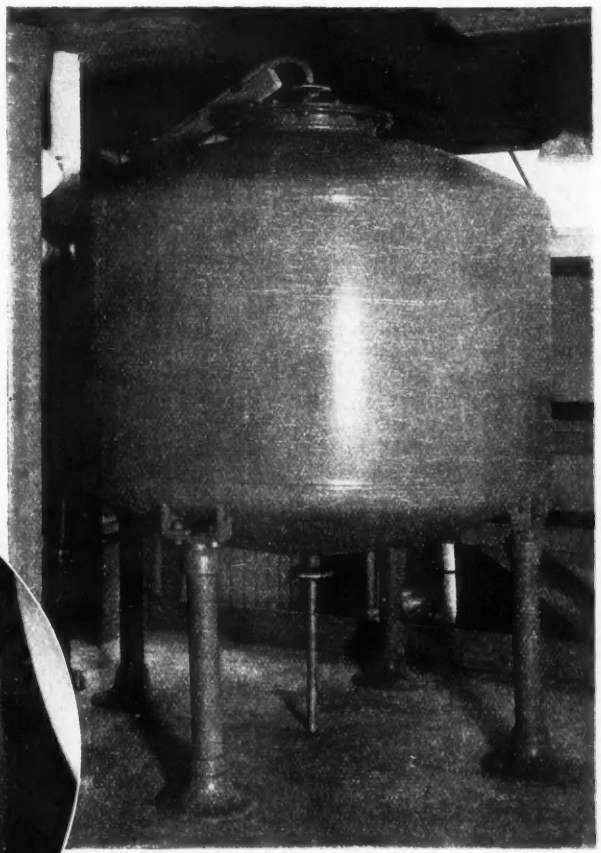
A. Drindberg and O. Guljaeva state that the aluminium salts of the acids are superior to the calcium salts with regard to the elasticity of the film, ageing and water resistance.

S. Lotareitchik recommends the following method for the manufacture of the aluminium salts. The acids are saponified with a solution of 10 to 15 per cent. caustic soda (in an excess of 15 to 20 per cent.), and a solution of 15 to 20 per cent. aluminium sulphate added. The aluminium salts are then dissolved at a temperature of 80 to 90° C. with double the amount of water. The water is distilled off by means of an organic solvant. Coatings on iron and wood, etc., kept very well for four years, but for outside exposure, the varnish can only be used in mixtures with asbestos. Absolutely white coatings, however, cannot be obtained, since the paints pigmented with zinc white always turns ivory coloured. According to the method of the U.S.S.R. Fat Research Institute the varnish is made by saponification of oxidised vaseline oil with caustic soda. The soap obtained is diluted with water to a solution of 10 per cent., and allowed to stand at 80°, whereby the unsaponifiable substances are separated. The excess of soda is neutralised with mineral acid. The production of aluminium soap is then carried out as described above (*Maslobojno Zhirovoe Delo*, *13*, 40).

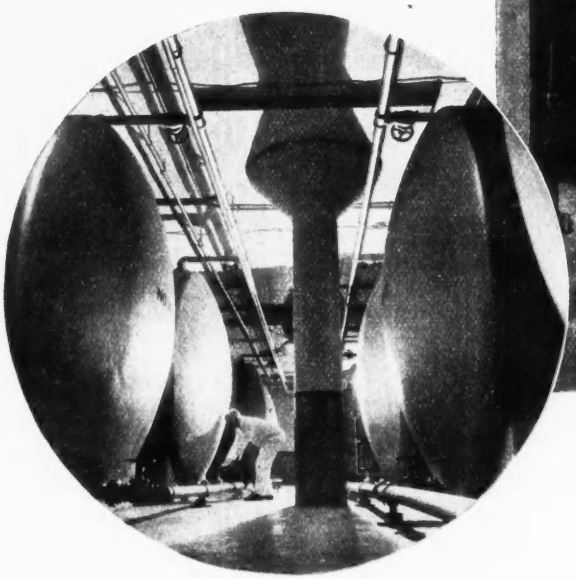
DEHYDRATION OF MAGNESIUM CHLORIDE HEXAHYDRATE AND CARNALLITE

THE dehydration of magnesium chloride hexahydrate and of carnallite has been investigated by Grube and Brauning (*Zeit. Elec.*, 1938, *44*, 314). By establishing the form of the isobaric dehydration curves at various pressures, it was found that the only stable hydrates of magnesium chloride are those containing 6, 4, 2, and 1 molecules of water. No evidence for the existence of a pentahydrate could be found. At atmospheric pressure the transition from the hexa- to the tetrahydrate occurs at 117° C.; the hexahydrate is completely stable in the air up to 55° C. The dehydration of carnallite proceeds first by the loss of four molecules of water to form the dihydrate $KCl.MgCl_2.2H_2O$. The dihydrate decomposes directly to form the anhydrous salt. At a pressure of 7 m.m., the dihydrate is stable between the temperatures of 80 and 120° C., complete dehydration being thus obtained at a conconsiderably lower temperature than in the case of $MgCl_2$.

PFAUDLER glass lined STEEL



A Pfaudler Glass Lined Steel Tank for storing dilute ammonia.



Some Pfaudler Glass Lined Steel Tanks for storing antiseptic astringents.

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This is the first of a series of announcements designed to show the application of Pfaudler Glass Lined Steel Equipment in various branches of the Chemical Industry. Why not file for future reference? Meantime we shall be pleased to forward fuller details of Pfaudler Storage Tanks, etc., at your request.

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Personal Notes

MR. E. E. LITTLE, who entered the firm of Bell's, asbestos manufacturers, of Slough, Bucks, as an office boy in 1888 and is now overseas manager, has received presentations from the chairman, directors, and employees to mark his 50 years with the firm.

PROFESSOR C. R. HARINGTON, professor of pathological chemistry in the University of London, has been appointed member of the Medical Research Council to fill one of the vacancies caused by the retirement of Professor A. J. Clark and Sir John Ledingham.

W. CULL DAVIES, Ph.D., D.Sc., lecturer in chemistry of University College, Cardiff; G. B. B. M. SUTHERLAND, M.A., Ph.D., fellow, lecturer and director of studies in natural sciences of Pembroke College, Cambridge, and W. TAYLOR, D.Sc., lecturer in chemistry of the Polytechnic, London, have been awarded Leverhulme Research Fellowships. Dr. Davies will undertake studies of the organic compounds of nitrogen, phosphorus, and arsenic; Dr. Sutherland the application of infra-red spectra to structural problems in chemistry and physics, and Dr. Taylor substitution mechanisms in aliphatic compounds.

LORD PORTAL, chairman of Wiggins, Teape, Ltd., paper makers, has been appointed chairman of the new Bacon Development Board, set up under the Bacon Industry Act, 1938.

MR. BASIL LYTHGOE, B.Sc., Ph.D. (Manchester) and MR. ERNEST WARHURST, M.Sc., Ph.D. (Manchester) have been appointed assistant lecturers in chemistry at Manchester University.

SIR MARTIN ONSLOW FORSTER, D.Sc. (London), Ph.D. (Würzburg), Fellow of the Indian Institute of Science, F.I.C., F.C.S., F.R.S., has been elected a Fellow of the City and Guilds of London Institute (F.C.G.I.).

MR. W. SIMPSON and MR. H. KELSEY, who have just completed 50 years' service with the firm of Tomlinson and Hayward, Ltd., agricultural chemists, Newland, Lincoln, have been presented with inscribed gold watches from the firm and workpeople.

OBITUARY

MR. JAMES SHAND, formerly manager of the Glengarioch Distillery, has died at Old Meldrum, Aberdeenshire, aged 93.

Chemical Notes from Foreign Sources

France

SATISFACTORY PROGRESS IS REPORTED in connection with the experimental cultivation of soya beans.

Belgium

FORMATION IS ANNOUNCED of "Le Lanital Belge," with a capital of 5 million Belgian francs, at Anvaing (Hanaut).

Czechoslovakia

THE EQUIPMENT OF THE FORMER NESTOMITZ SUGAR WORKS has been acquired by the Nestomitz Solvay Works with a view to extending the output of the latter concern.

CONSTRUCTION OF NEW WOOD-IMPREGNATING PLANT has been started near Kolcino in Carpathian Russia, by the Bohmisch-mänrische Holzimprägnierwerke A.G., of Brunn.

Japan

A GOVERNMENT STAPLE WOOL RESEARCH INSTITUTE is under construction in the prefecture of Kanagawa, at a cost of 2.2 million yen.

BUTYL ALCOHOL PRODUCTION will be undertaken at Takao by a company to be formed under the auspices of the Formosun Development Co., with a capital of three million yen.

DERRIS CULTIVATION HAS BEEN COMMENCED in Formosa over an area of 150 hectares. The concern involved has been granted permission to plant 1,500 hectares on condition that the total area is under cultivation within 3 years.

Germany

IN A REPORT ON THE PROGRESS of the wood saccharification industry, H. Scholler states that over 10,000 tons of sugar were produced in 1937 in solution form by the percolation process, representing an output of 50,000 hectolitres alcohol. One plant has been operating continuously for 6 years, a second has been in production for 1½ years and a third is just being started up. The foundation stone was recently laid of another plant to operate the Bergius process which will employ 250 to 300 workers and will be capable of an annual throughput of 300,000 cubic metres of wood. Each 100 kg. conifer waste (reckoned as dried wood substance) is capable of yielding 50 to 55 kg. reducing sugars or 40 kg. fermentable sugar which can be worked up to 24 litres alcohol or 12 kg protein in the form of a 50 per cent. fodder yeast.

Sweden

ADDITIONAL GOVERNMENT FUNDS have been allocated for the laboratory trials now in progress on the production of a phosphate fertiliser from Swedish apatite.

Jugoslavia

EVIDENCES OF THE EXISTENCE OF GOLD, SILVER AND PLATINUM DEPOSITS have been found at the foot of the Ljubic Mountains and have attracted the attention of British and American interests.

Esthonia

THE NEW ACETONE FACTORY of the Esthonian Shale Oil Works, at Kiviöli, is now completed and will commence production of acetone from the effluents of shale oil production at the rate of 80 tons per annum.

Hungary

A PROCESS FOR PREPARING AQUEOUS SOLUTIONS of follicular hormone and its derivatives from urethane compounds has been developed by the firm of Gedeon Richter. Oil-miscible organic solvents, such as benzyl alcohol and phenyl ethyl alcohol, are used in making concentrated injectable solutions of the hormone.

Poland

PRODUCTION OF PHOTOGRAPHIC PAPERS has been commenced by the Warsaw house of I. Franaszek.

A NEW WOOD-IMPREGNATING PLANT is in course of construction at Rozwadow in the central industrial region by the Polskie Zaklady Impregnacyjne Sp. Akc. This will make the fourth wood-impregnating plant operated by the company, the others being located at Bielitz, Zagorz and Warsaw respectively.

Holland

PRODUCTION OF PERCHLORETHYLENE, PENTACHLORETHANE AND HEXACHLORETHANE has been started at the works of the N.V. Electro Zuur en Waterstoff-fabriek, who are already making trichlorethylene and tetrachlorethane.

A SITE FOR THE ERECTION OF AN ALUMINIUM FACTORY has been acquired in Rotterdam by the Aluminium-Industrie en Handelsmaatschappij (Alinha), a concern linked up with the Aluminium Français S.A., of Paris.

From Week to Week

GERMAN OIL PRODUCTION in May amounted to 47,485 tons, and in June to 47,075 tons. The average monthly production in 1937 was 37,778 tons.

MEETINGS OF THE SHAREHOLDERS of the Petroleum Storage and Finance Corporation, Ltd., have approved resolutions giving effect to capital reorganisation proposals and to the change of the company's name to Cleveland Petroleum Co.

SHAW SCOTT AND CO., LTD., have issued a new price list for calcium cyanamide for the season 1938-39. They supply granular cyanamide (20.5 per cent. nitrogen, about 50 per cent. lime), and powdered and oiled cyanamide (20.6 per cent. nitrogen, about 60 per cent. lime).

CONTINUED ABSENCE OF IMPROVEMENT in North-East Coast iron and steel trade necessitates more plant being laid idle, and Dorman Long and Co. have decided to put out of action two blastfurnaces at the Cleveland ironworks. Of the 54 blastfurnaces in the north-eastern area only 22 will be in blast when those at the Cleveland works cease to operate.

REGULATIONS FOR CONTROLLING THE EARTHING of Electrical Installations to Metal Water-Pipes and Water Mains, drawn up and approved by the Institution of Civil Engineers, Institution of Electrical Engineers, Institution of Water Engineers, British Waterworks Association, and Water Companies' Association, have been published in booklet form by the Institution of Civil Engineers who consider it to be in the public interest that these regulations should be generally adopted.

IN VIEW OF THE SMALL ATTENDANCE at the recent annual meeting of British Bemberg, Ltd., the chairman, Mr. W. T. Cave, did not read the speech he had prepared, but a copy was handed to those present. It was stated that the board had discussed the present position with the debenture-holders in Amsterdam. Bearer certificates had been issued against the registered debentures, and the certificate holders had decided to appoint a committee to advise the registered holders of the debentures.

BALANCES AND WEIGHTS (No 89a), laboratory fittings (List F) and special apparatus for testing and research in connection with timber and wood products (No. 108), are the subject of three new catalogues issued by A. Gallenkamp and Co., Ltd.

IMPERIAL CHEMICAL INDUSTRIES of Australia and New Zealand, Ltd., are constructing a synthetic ammonia plant near Melbourne at the cost of £500,000. The plant will make Australia independent of supplies of nitric acid from overseas. Production is to be carried out by the Haber Bosch air fixation process.

A SUMMARY TRANSLATION of a Decree-Law, No. 2039, of May 28, 1938, regulating the importation into Roumania and the sale of pharmaceutical products, including patent medicines for human and veterinary use, serums and vaccines and biological products, etc., has been deposited with the Department of Overseas Trade in London. Particulars are given as to the taxes payable for permits to sell patent medicines, etc., in Roumania, conditions of sale and advertising propaganda. The full text of this translation may be consulted by persons interested at the Department of Overseas Trade, 35 Old Queen Street, London, S.W.1.

LAND HAS BEEN BOUGHT IN LANARKSHIRE for three new trading estates, according to an announcement by Lord Nigel Douglas-Hamilton, Commissioner for the Special Areas in Scotland, and Sir Steven Bilsland, chairman of Scottish Industrial Estates, Ltd., who will be chairman of the new company. When fully-developed the estates will accommodate about 150 factories and employ 3,000 persons. The three sites are at Carfin, Chapel Hall and Larkhall, and are near the towns of Airdrie, Coatbridge, Motherwell, Wishaw and Hamilton, where there is much unemployment. Their acquisition follows the success of the Scottish Industrial Estate at Hillington, Renfrewshire, where 70 manufacturing tenants have been secured in just over 12 months. A guarantee company, Lanarkshire Industrial Estates, Ltd., financed from the Special Areas Fund, will administer the estates. The registered office will be at 29 St. Vincent Place, Glasgow.

New Companies Registered

E.S.J. Laboratories, Ltd. 342,983.—Private company. Capital £100 in 100 shares of £1 each. To carry on business as manufacturers of and dealers in chemicals, gases, drugs, etc. Subscribers: Gladys I. Mackie, 161 Abbotsbury Road, Morden, Surrey; Alice Chaplin. Registered office: 72-80 Tanners Hill, Deptford, S.E.8.

Charles Newton (Chemical Works), Ltd. 342,894.—Private company. Capital £3,500 in 3,500 shares of £1 each. To carry on the business of manufacturing chemists, manufacturers of and dealers in inks, dyes, stains, paint or varnish, etc. Directors: Charles Newton, 65 Marriott Road, Stroud Green, N.4; Frederick R. Carr. Registered Office: 65 Marriott Road, Stroud Green, N.4.

Industrial Paint Manufacturers, Ltd. 342,946.—Private company. Capital £2,000 in 1,000 6 per cent. cumulative preference shares of £1 each and 20,000 ordinary shares of 1s. each. To carry on the business of oil, colour, paint, whitelead, enamel and varnish manufacturers and merchants, chemical manufacturers, colour grinders, etc. Directors: Norman A. Cooper, 7 Brunswick Gardens, W.8; Paul King. Registered office: 2 Austin Friars, E.C.2.

Process Patents, Ltd. 342,957.—Private company. Capital £200 in 200 shares of £1 each. To carry on the business of chemical, optical and photographic manufacturers and manufacturers of foils, sheets and moulded bodies of cellulosic and other plastic materials and the apparatus thereof; general merchants, metal founders, steel makers, refiners and rollers, blast furnace proprietors, smelters, electricians, etc. Subscribers: J. W. H. Thompson, Devereux Chambers, Temple, W.C.2; Arthur H. Field. Registered office: Devereux Chambers, Temple, W.C.2.

The Golden Valley Ochre and Oxide (Colours) Co., Ltd. 342,888.—Private company. Capital £75,000 in 75,000 shares of £1 each. To acquire from the liquidator of the Golden Valley Ochre and Oxide Co., Ltd., of Wick, near Bristol, the goodwill of that company, together with the freehold hereditaments and premises at Wick and Yate, Glos., and certain rights and liberties held and enjoyed in connection therewith, and certain shares and debentures held in its name, and its interest in the partnership carrying on business as the "Musa Syndicate," at Wick, and to carry on the business of general investment trust company, without any limit upon its sphere of operations, and that of prospectors, quarrymen, miners, manufacturers of and dealers in crude and manufactured earths, ochres, oxides, stone, strontia, clay, iron ore, tin, lead, copper, manganese, coal and other ores, metals and minerals, manufacturers of and dealers in all classes of colours, dyes, fillers, paints, varnishes, chemicals, drugs wood and bone extracts, and other like preparations, etc. Directors: Norman S. Kinnersley, The Homestead, Keynsham, Som.; Albert H. Orchard; Lt.-Col. Owen H. Bayldon; Charles M. Beavis; Henry W. Beavis; Commander Robert C. Bayldon.

The Dursley Gas Company (1938), Ltd. 342,884.—Public company. Capital £35,000 in 35,000 shares of £1 each. To acquire the undertaking and assets and liabilities of the Dursley Gas Light & Coke Co., Ltd., to manufacture and supply gas, coke, coal tar, pitch, asphaltum, ammoniacal liquor, creosote, oil and residual products, etc. Directors: Clifford H. Hunt, 15 Victoria Street, S.W.1; James R. Hyde.

Company News

Clinical Products, Ltd., 19 Charing Cross Road, W.C.2., has increased its nominal capital by the addition of £1,000 in £1 ordinary shares beyond the registered capital of £1,000.

Reckitt & Colman, Ltd., starch manufacturers, Dansom Lane, Hull, have increased their nominal capital by the addition of £5,999,900 in £1 ordinary shares beyond the registered capital of £100. This private company was registered on June 20, 1938, to acquire and amalgamate the undertakings and assets of Reckitt & Sons, Ltd., and J. & J. Colman, Ltd., or any part thereof.

Price's (Bromborough), Ltd., Bromborough Pool Works, Bromborough, Cheshire, have increased their nominal capital by the addition of £299,000 in £1 shares beyond the registered capital of £301,000. This increase is with a view to an amalgamation by the acquisition of the whole or part of the undertaking of Bluerock, Ltd.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

South Africa.—The Johannesburg City Council, Stores Department, is calling for tenders (Contract No. 981) for the supply and delivery, as and when required during the twelve months from October 1, 1938, of quantities of chloride of lime, alumina sulphate, and washing soda. Tenders endorsed "Contract No. 981—Chloride of Lime, etc.," should be addressed to the Town Clerk, Municipal Offices, Johannesburg, by whom they will be received up to noon on August 24, 1938. A copy of the specification and general and special conditions of tender may be inspected at the Department of Overseas Trade.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

NATIONAL COKE AND OIL CO., LTD., London, E.C. (M., 6/8/38.) July 22, £2,750 mortgage, to Tipton and District Permanent Benefit Building Society; charged on land and messuages at Upper Church Lane, Tibbington, Tipton. * Nil. June 16, 1937.

STEWARTS AND LLOYDS, LTD. (incorporated in Scotland). (M., 6/8/38.) July 22, deed (supplemental to a mortgage dated September 29, 1937) securing £250,000 inclusive of £150,000 secured by said mortgage, to Prudential Assurance Co., Ltd.; charge on property charged by said mortgage.

Satisfactions

CHARLES AINSWORTH AND CO., LTD., Holcombe Brook, bleachers and dyers, etc. (M.S., 6/8/38.) Satisfaction July 25, £300 (not ex.), registered April 20, 1933.

STOCKTON CHEMICAL ENGINEERS AND RILEY BOILERS, LTD. (M.S., 6/8/38.) Satisfactions July 21, £5,000, registered March 25, 1935, and July 19, 1935, and of debentures registered June 22, 1936, to the extent of £6,000 and unissued balance cancelled.

Receiverships

ORMISTON'S ALUMINA, LTD., Brentford.—J. L. Harper ceased to act as receiver on July 1.

Companies Winding-up Voluntary

BRADFIELD CHEMICAL PRODUCTS, LTD. (C.W.U.V., 6/8/38.) By reason of its liabilities, July 25, Arthur Riley, Crescent Buildings, Half Moon Street, Huddersfield, chartered accountant, appointed liquidator.

Chemical Markets

LONDON.—With the holiday season now in full swing quiet conditions prevail in most sections of the market and trade is limited to small orders for items normally enjoying a regular call. There are no price changes of any importance to record and on the whole values are maintained at recent levels. Formaldehyde and ammonium chloride are active items and quotations for contract quantities are competitive. In the coal tar section the position shows little change from last week and buying interest is definitely slow.

MANCHESTER.—Comparatively little business has been stirring during the past week in any section of the Manchester chemical market, the holidays having a noticeable effect on the volume of new buying as well as the call for supplies against existing commitments. It is expected that from now on, however, conditions will become more active as the seasonal influences disappear, although the reduced activity at the consuming end will probably continue to restrict deliveries. In the meantime, values in most sections are well held. Little fresh weakness has developed in the by-products market locally, but there has been no awakening of buying interest and actual transactions have been few and small.

GLASGOW.—The demand for general chemicals has been very quiet during the week, both for home trade and export, on account of the holidays. Prices however, continue quite steady at about the figures quoted last week, with no important changes to report.

Books Received

The Chemical Manufacturers' Directory. London: Simpkin Marshall, Ltd. Pp. 191. 4s. 6d.

General Chemistry. By E. P. Schoch and W. A. Felsing. McGraw-Hill Publishing Co., Ltd. Pp. 521. 18s.

Problems in Organic Chemistry. By E. H. Huntress. London: McGraw-Hill Publishing Co., Ltd. Pp. 270. 12s. 6d.

Reaction Kinetics. A General Discussion held by the Faraday Society. London: Gurney & Jackson. Pp. 268. 12s. 6d.

The Textbook of Organic Chemistry. By G. H. Richter. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Ltd. Pp. 711. 20s.

Chemical and Allied Stocks and Shares

HOLIDAY influences have continued to restrict the volume of business on the Stock Exchange, and as a result movements in share values have been to rather lower levels. Securities of companies associated with the chemical and allied trades were relatively steady. Distillers at 98s. 6d. are within 6d. of the price ruling a week ago, while Imperial Chemical ordinary units at 31s. 7½d. are also little changed. The interim dvidend of the latter company falls to be declared next month and the current view is that if this is maintained at 3 per cent. there will be reasonable possibilities of the total dividend being around 8 per cent. For the previous year it was 8½ per cent. It is, of course, the practice of the company to leave the greater part of the year's distribution until the final dividend when the full results are known. Borax Consolidated at 26s. 6d. are unchanged on the week. The market is not anticipating that the practice of paying an interim dividend on these £1 deferred units will be resumed this year, but in view of the statements at the last meeting there are hopes that an interim may be paid on the £5 preferred units, which are quoted at par. General Refractories have gone back from 14s. to 13s. 6d. As mentioned here last week, this company's interim dividend decision falls to be made during the next few weeks.

B. Laporte were inactive, but the list price remained at 87s. 6d., while Greeff-Chemicals Holdings 5s. units were again 6s. 3d., and Monsanto Chemicals preference shares were quoted at 22s. 6d. Fison Packard were again steady around 34s., and Cooper McDougall and Robertson ordinary shares remained at 28s. Lever and Unilever at 38s. 6d. were also a relatively steady feature, while Swedish Match were again 26s. Imperial Smelting continued to change hands around 11s. 10½d., but there are divergent views in the market whether the dividend is likely to be kept on a 5 per cent. basis. United Glass Bottle were reported to be rather more active and have made the rather higher price of 49s. United Premier Oil and Cake were virtually unchanged at 7s. 3d., and British Oil and Cake Mills were steady at 45s.

British Plaster Board remained a firmer market, and at 27s. 9d. have held the greater part of their recent improvement. On the other hand, Associated Cement have been lowered from 81s. 10½d. to 81s. United Molasses at 23s. are 3d. down, but have remained rather more active in response to the view that later in the year tanker freight rates are likely to show some improvement. British Industrial Plastics were again more active and were again quoted around 2s. 9d., accompanied by reports that the plastics industry is continuing to show steady expansion. Erinoid were unchanged at 3s. 6d., and British Xylonite 5 per cent. debentures were quoted at 103½. Pinchin Johnson were little changed at 32s. 4½d. and International Paint and Indestructible Paint were also around the same prices as a week ago. The interim dividend announcements of the three last-named companies fall to be made next month. Dufay-Chromex attracted attention and at 5s. 10½d. have more than held the rise which followed publication of the progress report. Ilford ordinary shares were slightly better in sympathy.

Triplex Glass 10s. shares remained a rather uncertain market owing to fears of a reduction in the forthcoming dividend, but the price at the time of writing is 35s., or 6d. better than a week ago. British Indestructo Glass were little changed at 3s., and Lancegaye Glass shares remained active around 3s. 3d.

Boots Pure Drug were firm and have made the slightly better price of 42s. 6d., while Sangers at 23s. 3d. were well maintained. Timothy Whites and Taylors were 25s. 6d., compared with 25s. 9d. a week ago. British Aluminium continued to fluctuate, but are 49s. at the time of writing. Courtaulds have made the higher price of 29s. 3d., but various other textile shares were moderately reactionary. British Match were again 33s. International Nickel at 85½ are virtually unchanged, and were not affected by the dividend, which was in accordance with general market estimates.

"Shell," Anglo-Iranian and other leading oil shares were slightly lower on balance, but this was attributed to the tendency shown this week by securities which usually move closely with the general trend of markets.